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A Review on Prediction of Personality Traits Considering Interview Answers with Personality Models

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Abstract: Personality assessment of candidate has been considered a most challenging task. It is helping recruiters to perform analysis of Strength, Weakness, Opportunities, Threat of the candidate. SWOT analysis is also an indicator of job satisfaction and job performance. Judging one's personality is an important part of selection process which helps recruiters to analyse the credibility of the candidate. Objective of such research is to predict the personality considering candidates answers in interview questions. This paper has presented different techniques and models used for personality assessment. Various existing research works are considered for predicting traits of person. The methodology used by existing research works are presented along with the scope of research in field of personality assessment with reference to interview answers.
Keywords: Personality Prediction, HEXACO Personality Traits, Linguistic Analysis, Big 5

I. INTRODUCTION

Personality assessment of candidate is challenging task as it helps recruiters to do SWOT analysis (Strength, Weakness, Opportunities, Threat) of the candidate. It is also an indicator of job performance and job satisfaction. Judging one's personality is an important part of selection process which helps recruiters to analyse the credibility of the candidate. From study it has been found that textual content of interview answers from standard interview question is a good metric for predicting someone's personality trait. To achieve this goal will use machine learning models. From past decades NLP and Machine Learning models are gaining popularity in the area of text classification, analysis and topic modelling. Several researches have used using NLP as well as ML mechanism. Many researchers made a regression model. This model is to infer HEXACO trait data from textual information. In this study various methods are compared and will come up with optimized method for personality prediction. Text representation in the form of Term-Frequency Inverse Document Frequency, Word to Vector, Topic Modelling various methods are compared to check which gives best performance as per the work. The objective is to infer a personality of candidate with the help of textual content that are available in form of interview answers. These answers eliminate a subjective bias.

Personality of a person encircles every aspect of life. It describes the pattern of thinking, feeling and characteristics that predict and describe an individual's behaviour and also influences daily life activities including emotions, preference, motives and health. Personality refer to the distinctive set of characteristics of a person that effect their habits, behaviour's, attitude and pattern of thoughts.

The personal qualities of human beings indicate their intention and effectiveness overall development. It also considered in the form of indication which will easily identify how much they are satisfied with their job. Whenever recruiters determine the personal qualities of job seekers at the time of recruitment, it becomes possible for recruiters to take improved hiring decisions, which is very much important.

It has been clearly represented by existing researches that it becomes possible to use written substance of interviewed questions for the understanding of those qualities which are associated with the personality of an individual. These types of questions, generally, derived on the basis of educational program and assessment of operational environment Personal qualities become a significant internal structure on the basis of which the difference in the middle of two people can be easily described. The recognition of personality in a reliable, valid and efficient way becomes a useful objective. On the other hand, the method which has been used usually, for the evaluation of personality like registered records or meetings held in the company of psychologists becomes costly and considered unrealistic in the space of social networking because they need subjects to take active actions in order to provide support.

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II. RELATED WORKS

From many years, researchers who are dealing in the field of psychology carried out lots of work for systematic understanding of personal qualities and attributes. Finally, a valid design has been developed, it has been revealed by them that a close relationship exists in the middle of normal personality characteristic and behavioural pattern. The manner in which personal qualities, achievement, job satisfaction, mental illnesses and job efficiency are related with each other is also explored. The ability to predict personality makes a huge impact in many areas. It has been noticed out of already provided work that personal qualities and achievements are closely linked with each other not only in work place but also in personal relationships. It became possible for social networking site to make this relationship better if they have extensive knowledge about personal qualities. In addition to this, it has been clearly demonstrated by earlier researches. Whenever online requirement determined the personal qualities out of social networking site it becomes possible for them to modify their information and demonstration related to such type of information. It has been showed by many researches that description of personal qualities becomes very useful in the setting of work place.

A. Personality Prediction Comparison

Jayaratne and Jayatilleke [2] presented Predicting Personality Using Answers to Open-Ended Interview Questions. It has been clearly represented by this research that it becomes possible to use written substance of interview questions for the understanding of those qualities which are associated with the personality of an individual. These types of questions, generally, derived on the basis of educational program and assessment of operational environment. Here, for the representation of textual content five unlike methods has been used and after comparing their effectiveness it has been noticed that performance of TFIDF in the company of LDA topics becomes best where r = 0.39.

B. Personality Prediction on Social Media

Di Xue et al. [14] presented personality recognition over social media using label distribution learning. On the basis of this research, an approach which is connected with big 5 personality recognition (PR) has been put forwarded out of small blog in the setting of language which is used by Chinese people in the company of state of art machine learning model which has been characterized with the name distribution learning (LDL). It allocates distribute name in place of an individual name. It becomes possible for LDL to deal with different name of single case. It has been clearly represented by experimental consequences that in comparison to usual algorithms, performance of this algorithms is quite improved. From the future perspective authors wants to discover best possible characteristics extent using deep learning method. Basic intention behind this is to improve the faithfulness of the LDL method at the time of personality verification.

C. Encoding Text Information with GCN

Zhe Wang et al. [5] presented Encoding Text Information with Graph Convolution Networks for Personality Recognition. Here, the method related to graph convolving system has been used by the research worker in order to deduce personal qualities of an individual out of his/ her social network status. Due to the close relation of 5 fundamental personality qualities such as openness and comprehends (like details related to status) with textual qualities, here Big Five design was primarily used for the purpose of research. Personality requirement of GCN represented using text and records. It has been clearly represented by experimental consequences that this approach becomes highly useful in situation where volume of information
is quite small.

D. Resampling for Personality Recognition

Z. Wang et al. [11] presented SMOTETomek dependent resampling in case of personality Recognition. Major issue in case of user personality recognition is less accuracy. Here, influence of uneven distribution of information and overlapping of favorable and unfavorable sample over machine learning organization design has been analyzed. Such type of design come in to the existence on the basis of method which are used for the purpose of information re sampling. With the help of this method it becomes possible to improve organizition precision. It becomes possible to resolve such type of issues when the information are resampled in an effective manner. An approach for the determination of personality has been introduced by them for the very first time. In order to achieve their objective they employ PSO and SMOTETomek resampling method. It is different from useful SMOTETomek resampling and capable of running PSO ccharacteristic optimization in support of all characteristic combining groups. It has been clearly noticed by them out of practical consequences that in comparison to large words, organization influences of small words are better. It becomes possible that personality penetration precision of simple textual information is high accuracy. It has been observed that there is no related external data.

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E. Personality Predictions Based on User Behaviour

Tadesse et al. [8] presented Personality Predictions Based on User Behaviour on Social Media such as Facebook. Considering various qualities and arrangements of Big five design characteristic of various Facebook users has been examined. It is examined that availability of structures of social networks. Moreover linguistic characteristics that are related to personality interactions are also used. It has been clearly represented by the consequences of prediction accuracy that a quality determination network conduct standard test in support of each and every characteristic group even if identical information groups are tested out in the company of more than seventy two percent prediction precession.

F. Predicting Dark Triad Personality Traits

Sumner et al. [17] presented predicting Personality Traits that are Dark Triad. Prediction is supported by Twitter. Here, emphasis was placed on the personality qualities of Big Five design. At the same time, the domain unsociable qualities like self-admiration, diplomacy and mental disease remain mysterious.

Usually, these qualities become famous in the form of Dark Triad. Here, on the basis of Twitter demand, the extent up to which these unsociable qualities can be determined is identified. For this purpose, a comparison in the middle of Big 5 personality characteristics of two thousand and nine hundred and twenty-seven Twitter users and Dark Triad was conducted in the company of profile qualities. It has been clearly noticed out of examination consequences that these two factors have a close relationship from a statistical point of view.

G. Predicting Personality from Twitter

Golbeck et al. [20] presented Predicting Personality from Twitter. With the help of approach, which has been introduced here for the very first time, it becomes possible to determine client qualities in an accurate way. For this purpose, details present on their social networking site Twitter are analyzed.

The consequences of this assessment provide give identical outputs in support of frankness, loyalty. On the other hand, it fails to give similar outputs in support of companion ability, sociability, and psychoneurosis. It has been explored out of result that consequences could improve if the size of sample is large. In the company of just 50 subjects, formation of useful learning method becomes a quite difficult task.

III. PROBLEM FORMULATION

However, there are several research works in the field of prediction considering personality features. But seen several issues in existing research.

The major issue is the lack of accuracy that have been observed due to complexity of operation. Moreover, it has been observed that there is lack of performance as the training of dataset is time consuming process. There is need to introduce the novel method to get good optimised results by which system will able to provide best solution more accurately in lesser time. The result of upcoming mechanisms is supposed to be optimized.

IV. RESEARCH METHODOLOGY

In order to predict score of a personality feature, there is need to implement ensembling technique in Machine Learning. As there are many methodologies, we can analyse various algorithms on regression model to get the optimized result.

1) *Natural Language Processing Based Text Mining with Machine Learning:* The volume of information available online increased very much because of internet arrival. Larger part of this information is helpful and important from various perspectives. Therefore, storage of all this information becomes essential. Larger part of this information exists in the form of words. The most difficult task for any human being is to identify the information which is closely related to their subject matter. It becomes possible to beat such type of problems with the help of word arrangements. It becomes famous in the form of process where information, which is arranged in the form of papers is organized in two or more categories. Here, it becomes possible to say that every paper be a part of either an individual category or it may be a part of different classes. Method employed for the purpose of textual material organization into already specified categories is textual analysis. It becomes possible to do organization either physically or automatically. In comparison to automatic organization method, when organization is done manually. This is time taking and demand high level of accuracy whereas automatic organization method consumes less time and highly useful because it arranges textual material mechanically.

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V. PERSONALITY INVENTORY MODEL

During the process of staff selection, temperament of an individual is tested out with the help of generally recognized method like NEO-PI-R, HEXACO-PI-R. Moreover, personality questionnaire that are depending on either five or six factor model that have been used of personality considered. At the same time, conduction of such type of test at the time of recruitment makes this process costlier. In addition to this, in comparison to other selection method like interview, written test etc, this test fails to get the support of job seeker. It happens because it subside the knowledge of job seeker. It is the reason, due to which such type of test is not conducted everywhere in the way in which other tests are conducted. At the same time, partiality done by the interviewer at the time of recruitment due to their fixed idea assumed in the form of highly criticized part of recruitment process. The capability of job seeker and efficiency of their work in the upcoming time is determined. This determination is made in accurate manner when their selection is done on the basis of an organized recruitment process. In an organized process, all the job seekers going through the identical selection process and their evaluation is done on the basis of an extremely specified manner. The questioning done at the time of organized recruitment process is extracted with the help of work assessment in place of interviewer demand and normally established on the basis of educational program and assessment of operational environment.

A. The Big Five Personality Inventory

At this point of time, the design which is highly recommended for the determination of personality arrangement is the design of "Big Five" shown in Fig. 1. It comes in to existence in the form of design which has been researched in a best possible way. Tupes and Christal considered frankness, loyalty, companion ability, sociability, and psychoneurosis in the form of basic characteristics which come in to existence after the evaluation of earlier personality tests. It becomes possible to distinguish Big Five features in:

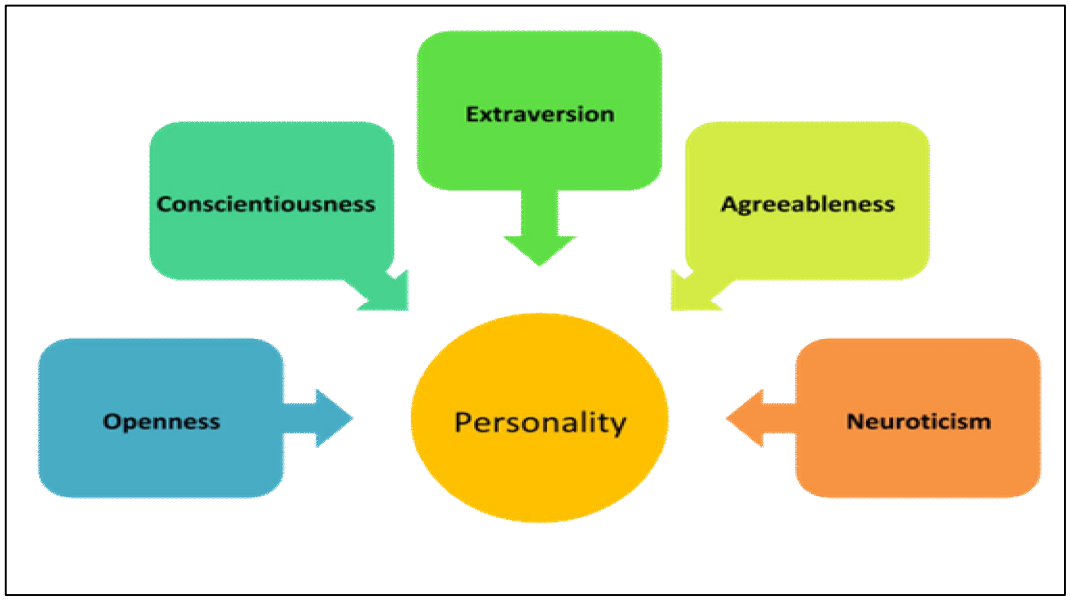

Fig. 1: Big Five Model of Personality Trait

1) *Transparency in Favor of Knowledge:* Extraordinary, Brilliant, And Creative. High scorers usually pleasing and elaborate in experience and acknowledge different opinions, perspective, and skills.
2) *Loyalty:* liable, efficient, determined. Hard-working human beings are highly faithful and usually remain busy and achieve good scores.
3) *Companion Ability:* friendly, good-natured, self-confident. A person which is good natured, dynamic and sociable gets inspiration out of public circumstances.
4) *Sociability:* Supportive, Kind hearted, Promoting. Human beings having supportive nature are considered in the form of peace builders and usually remain positive.
5) *Psychoneurosis:* Human beings who always remain worried, impatient, sensible and suffering from neurological disorder are irritable, stressful, become negative without difficulty.

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B. HEXACO Personality Design

This form of design which has been primarily used for the purpose of personality illustrations shown in Fig. 2. After doing lot of research work in a verbal manner it becomes famous in the form of 6 element design of personality. The 6 elements become honest (H), explosiveness (E), eXtrovert(X), acceptability (A), Conscientiousness (C) and open minded [in favor of knowledge] (O). There exist a close relationship in the middle of such type of design and the design which is described earlier and become famous in the form of Big Five design, alternately known in the form of OCEAN design. Such type of design consists of 5 elements, frankness, loyalty, companion ability, sociability, and psychoneurosis. Both of this design is built on the basis of "Verbal Theory". According to this theory qualities of an individual are encrypted in word. Five elements of both these designs are delicately different. Honesty is the element of HEXACO design which comes out in the form of unique element. This design turned out to be a right choice in comparison to Big Five because it described those personality developments which Big Five design fails to explain.

Fig. 2: HEXACO Model of Personality Trait

VI. SCOPE OF RESEARCH

The scope of personality assessment of candidate is very important in day-to-day life because it is helping recruiters to perform analysis of Strength, Weakness, Opportunities and Threat of the candidate. Such research plays significant role in predicting personality according to the answers of candidates that are asked during interview questions. Study of various techniques would support in building models required for personality assessment. Research has explained the limitation of existing researches presented in order to coin platform with high performance for personality assessment.

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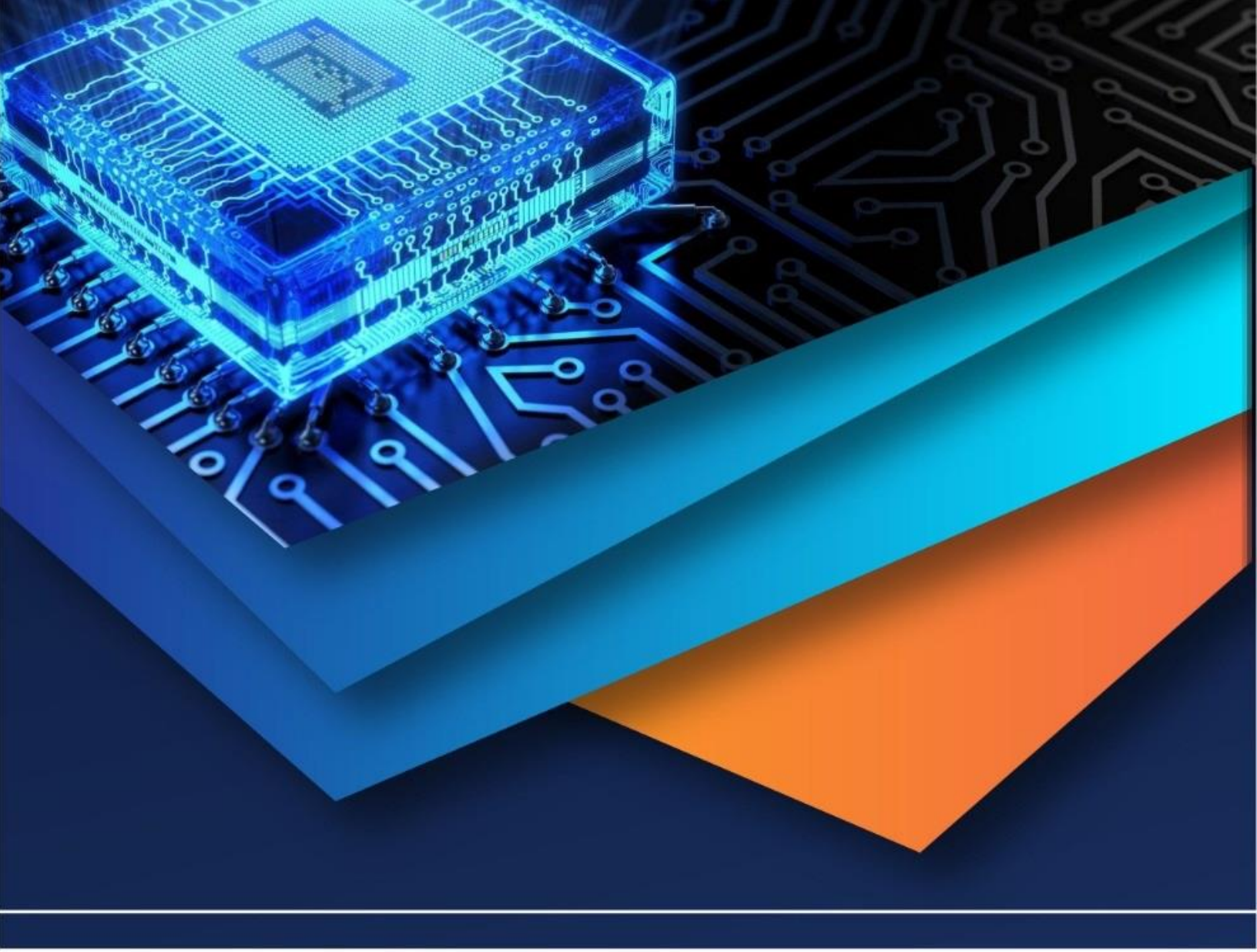

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